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10 August 1970

MEMORANDUM FOR: Chairman, Education and Training Subcommittee,
Information Handling Committee, United States
Intelligence Board

SUBJECT : Central Intelligence Agency Contribution to Annual
Information Science Training Report

REFERENCE : Central Intelligence Agency Contribution to Annual
Information Science Training Report, 24 July 1969

The following narrative and statistical information on information science training given or sponsored by the Central Intelligence Agency during Fy '70 is in accordance with the format used in the reference above.

Elements of the Report

I. Statistical Information for FY '70

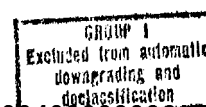
A. Listing of Information Science Courses:

1. Information science courses taken during the period 1 July 1969 - 30 June 1970 are enumerated in Attachment A.

B. Listings of Full-time University Training:

1. Sponsoring elements of the Agency and courses, for the period 1 July 1969 - 30 June 1970 are recorded as Attachment B. The courses enumerated are not in Attachment A. unless attended on a part-time basis by individuals other than those referred to in Attachment B. For immediate reference, two students attended full-time training during FY '70.

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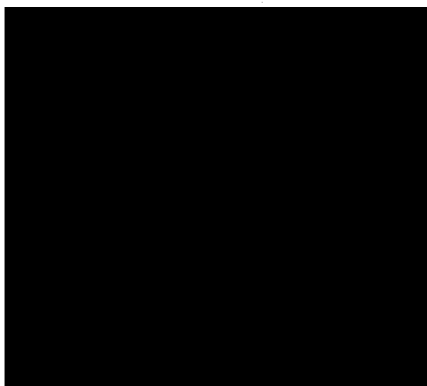
II. Narrative Information

A. Numbers Receiving Training:

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1. In FY '70, [REDACTED] students attended information science courses and [REDACTED] individuals were identified. The "student" and "individual" attendees from each of the Directorates and the Office of the Director are as follows:

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<u>Directorate</u>	<u>Students</u>	<u>Individuals</u>
Intelligence		
Science and Technology		
Support		
Plans		
Office of Director		

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2. FY '70, 68% of the students attended CIA-sponsored in-house training; 11% attended universities and colleges; 6% other government agencies and 15% took training offered by manufacturers, contractors and professional societies.

B. Progress in Information Science Programs - Emphasizing Changes:

1. The Training Staff, Office of Computer Services (OCS), Science & Technology Directorate, continues to provide the majority of internal Agency training courses. Course titles, frequency and comparisons with FY '69 are noted below:

<u>Course Title</u>	<u>Frequency</u>	<u>Changes from FY '69 Report</u>
ADP Orientation	Six	
Basic ADEPT	Two	

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<u>Course Title</u>	<u>Frequency</u>	<u>Changes from FY '69 Report</u>
APL/360	Two	
FORTTRAN IV	"	
Operating System/360	"	Added
Programming Language/One	"	
Systems Analysis	"	
ALC Marco Writing	One	
PL/1 Marco Writing	"	Added
Interactive Course	"	
Linear Programming	"	
Operators Course	"	Added
Systems Analysis (Brandon)	"	Added
Modified ADEPT	None	Cancelled
PL/1 Programming Techniques	"	"
COBOL Programming Techniques	"	"

2. The Office of Economic Research (OER), Intelligence Directorate, in its training program, continues to emphasize a detailed introduction for selected analysts to FORTRAN IV through its course: Introduction to Computer Applications in Economic Intelligence. Fourteen analysts from OER and three from the Office of Strategic Research, Intelligence Directorate, attended the third running of this course late in FY '70. At this point, the number of OER analysts with a detailed introduction to at least one high-level programming language approaches 60. One member of OER was enrolled in the 6-month ADEPT course run by the

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Office of Computer Services. With so many language-educated analysts at hand, OER has been able to offer short, intense tutorials in general-purpose ADP systems like MASSAGER and DATABANK. A major change in the ADP program was the training of some 30 analysts in the use of time-sharing services made available by OCS in mid-FY '70. Finally, more attention was given to training a select group of OER Personnel in OS/360, utilities, etc. Three OER analysts were enrolled in the Brandon course - conversely we brought an OCS analysts into OER for one year.

3. The Agency component in the National Photographic Interpretation Center (NPIC) most occupied with information science activities is the Automated Information Division. Its training efforts for FY '70 were as follows: (all but the first are repeats from FY '69)

Programming - UNIVAC 494 (six week course for 10-15 programmers and operator personnel at least three times a year).

NSA Sponsored RYE UNIVAC 494 Programmer's Course

UNIVAC Sponsored Courses (Both classroom instruction and home study)

Decision Tables: Techniques and Applications (Two-day course presented at NPIC to twenty division personnel by a Department of Agriculture Graduate School instructor. This was run once this year. Further runnings are planned for FY '71.

Photogrammetry Courses (Two courses were given again this year for programmers who are providing programs to meet the Center's mensuration objectives).

Internal On-the-Job Training for New Personnel, CO-OP

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Students and Summer Interns (All programmers trainees are expected to undergo training within the Division on all aspects of ADP operations prior to assignment to computer programming operations. This includes production control, computer operations, programming training and program preparation assignment).

4. The Electronic Data Processing Division (EDPD), Central Reference Service, Intelligence Directorate, sent some 75 students to information science training during this period, no sizeable in-house training effort was undertaken. IBM's announcement of June 1969 - referred to as "unbundling" will have considerable future impact on EDPD training plans. Viewed as a mixed blessing, it portends budget increases for training but offers greater flexibility in choosing training programs as we no longer need to deal exclusively with IBM.

C. Value of Information Science Training Received:

1. The Plans Directorate's Systems Group continues to move according to plan in various phases of its automation effort. The greatest single difficulty lies in educating managers to the potential gains and costs of greater use of automated data processing in this Directorate.

2. The Support Directorate's Support Information Processing System (SIPS) task force has found that as basic ADP training is accomplished for more and more persons and as special training like the Brandon Systems course is provided those marked for systems roles, more concern is developing for the manager and his role. The ADP mystique has apparently fostered the notion that managing the ADP resource is a separate form of management science. More attention must be given to emphasizing similarities between managing ADP and managing any other function rather than continuing to dwell on teaching managers the rudiments of computers and ADP systems analysis. The ADP function should be an integral part of the overall management activity.

3. According to OCS, ADP training has provided a number of benefits. It has enabled line managers to provide new or inexperienced personnel with a basic level of computer knowledge so that they are ready

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to assume productive programming tasks when they are assigned to programmer positions. Computer operators have also benefited from courses that have gone beyond on-the-job training to more thorough classroom instruction in the operating system and hardware functions. The ADP Orientation course continues to have a large number of applicants from all levels of personnel. This course and system analysis courses have provided students with methods for identifying the advantages and disadvantages of ADP. Also, training has provided a greater appreciation for the basic steps involved in moving an ADP requirement from concept to operational systems.

4. A principal goal of OER's ADP training has been to reduce the difficulty of linking the "user's" definition of the problem with the ADP definition and solution. For a large class of problems, most of which are characterized by short programming solutions, the difficulty has been eliminated entirely because the "user" analyst does his own programming. Generally this has resulted in more rapid (in calendar terms) solution of problems as well as less expenditure of human resources. The ADP training program, moreover, has benefited the office in that it has been used as a vehicle for training personnel in quantitative tools of analysis. In both regards we are moving according to plan. Further, most of the managers in OER have attended introductory ADP training courses and internally offered, ad hoc seminars on tools of economic analysis that require ADP support for their solutions. No formal, scheduled training program is offered, but we are considering establishment of such a program, which will be tailored to the type of problems faced by our managers.

5. The by-word in NPIC's Automated Information Division, concerning training beyond the entered apprentice, has been "tailor" the training to the individual's need for immediate use in his Branch and Division. For the most part, the selection of courses and the right individuals to attend such courses, have contributed immensely to producing a good production-minded group of information processing professionals.

D. Experience Gained in Hiring [already trained personnel] and in retraining "old hands:"

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1. The Plans Directorate has not been able to hire already-trained personnel. In retraining "old hands," great care must be used in screening to determine potential and capabilities. Most of those qualified to become programmers have been identified and trained.

2. The Support Directorate has had a limited opportunity in hiring experienced ADP personnel. Many applicant folders have been reviewed and in general, experienced personnel have starting-salary requirements which are difficult to meet. The Support Directorate has had far more experience in retraining "old hands." It can be done successfully if limited objectives are set. These people can acquire the skills necessary to collect and analyze information about current operations and they can translate these results into new system requirements with assistance from the "user" offices. However, as the systems effort moves into systems design, we are experiencing some difficulty with these retrained people. They feel a need for more detailed understanding of third generation hardware and software. Much of this feeling comes from inexperience; ideally systems should be designed in terms of "users" requirements. The fact is that everyone, computer systems designer included, is in the dark about computer systems and software. The solution for this problem does not rest so much in additional training as it does in additional experience.

3. The Office of Computer Services of the Science and Technology Directorate has had little to do with retraining during this past year - regards its own personnel. One person has been hired with a degree in information science; four have been hired with a year or more of experience in information science and eleven have been hired with a degree in other fields needed in connection with computer applications.

4. The Office of Economic Research, Intelligence Directorate, in hiring from the campuses, has noted that universities are placing increased emphasis on quantitative methods in economic analysis and accordingly, new recruits to the Office are likely to have had at least an introduction to ADP.

5. Of the total number of information science personnel now on board in the Automated Information Division, NPIC, [REDACTED] hired with certificates in data processing (two-year DPMA) and [REDACTED] hired with one year or more experience in information science - [REDACTED] of the latter are equipment operators.

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E. Education and Training Plans for FY '71:

1. Proposed training

a. The Training Staff, Office of Computer Services, has scheduled the following training program for FY '71:

<u>Course Title</u>	<u>Length</u>	<u>Frequency</u>
ADP Orientation (ft)	3 days	5 runnings
PL/1 (pt-A. M.)	10 days	2 runnings
Basic ADEPT (ft)	75 days	2 runnings
PL/1 (pt-A. M.)	5 days	1 running
OS/360 (pt-A. M.)	10 days	3 runnings
FORTTRAN (ft)	10 days	1 running

b. The Office of Economic Research plans an advance version of the Introduction to Computer Application in Economic Intelligence course and hopes to mount an Introduction to Computer Applications for Economic Intelligence Managers course during FY '71.

c. Although not formerly planned or projected at this time, internal, on-the-job training and one and two-day orientation courses will undoubtedly occur in Agency elements during FY '71. Often an unforeseen circumstance or priority stimulates the creation of a special training module or seminar which may run only once and perhaps not even be reported.

2. Number of persons programmed for Information Science training for FY '71:

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a. Universities and Technical Schools

1. Full-time:

2. Part-time:

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b. In Own Agency:

c. Other Government Agencies:

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d. Manufacturers, Contractors, Professional Societies:

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3. The projected budget for information science training for FY '71 is approximately [REDACTED] This is some \$150,000 less than the projection for FY '70 and reflects certain budgetary costs and personnel reductions. It includes student and instructor salaries, and course fees, training hardware and software. Further, the decline in the numbers of students attending information science training which is presumed will continue-although not as drastically as the difference between FY '69 and FY '70-and should be sufficient to make our budget prognosis realistic even in the light of inflationary costs and vendor "unbundling."

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CIA Member, Education and Training
Subcommittee, Information Handling
Committee, United States Intelligence Board

Attachments
As stated